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IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE

**Patent Application**

**Inventors(s):** George Earl Peterson      **Case:** 18

**Serial No.:** 09/915,963      **Filing Date:** July 26, 2001

**Examiner:** Shih Chao Chen      **Group Art Unit:** 2821

**Title:** Broadband Polling Structure

**THE COMMISSIONER OF PATENTS AND TRADEMARKS**  
**ALEXANDRIA, VA 22313-1450**

**SIR:**

In response to the Notification of Non-Compliant Appeal Brief of May 29, 2007, enclosed is an **Amended Appeal Brief** (in triplicate) in the above-identified application.

In the event of any non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit my **VISA** as required to correct the error. Form 2038 is not attached but will be provided if necessary.

Respectfully,

  
Michael J. Urbano  
Attorney for Applicant(s)  
Reg. No. 24, 522  
610-691-7710

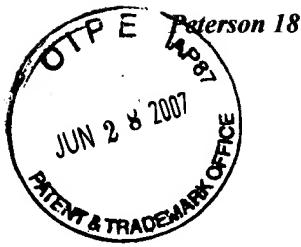
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Michael J. Urbano: Michael J. Urbano



**IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE**

**Patent Application**

**Inventors(s):** George Earl Peterson      **Case:** 18  
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**THE COMMISSIONER OF PATENTS AND TRADEMARKS  
WASHINGTON, DC 20231**

**SIR:**

**APPEAL BRIEF UNDER 37 CFR § 41.37**

**I. Real Party In Interest**

The real party in interest is Lucent Technologies Inc., 600 Mountain Avenue, PO Box 636, Murray Hill, NJ, 07974-0636.

**II. Related Appeals and Interferences**

There are no related interferences.

There is a related appeal. More specifically, Appeal No. 2005-2760 (copy included in Appendix B) addressed Section 112, 102 and 103 issues of *original* claims 1-3, 5-13, 15-19, 21 and 23-25 in the instant application.

Original dependent Claim 20, which had been allowed and was not therefore considered in the Board's decision, now stands rejected under Section 103.

Subsequent to the Board's decision independent Claims 1, 11 and 21 were amended to incorporate the fast wave limitations of original Claims 2 and 12. Accordingly, Claims 2 and 12 were canceled.

**III. Status of the Claims**

**Claims Extant:** Claims 1, 3-11 and 13-25 are pending in this case.

**Claims Canceled:** Claims 2 and 12 have been canceled.

**Claims Rejected:** Claims 1, 5-11, 15-21 and 23-25 stand finally rejected. More specifically, these claims have been rejected under 35 USC §103(a) as being unpatentable over Wicks *et al.*, US Statutory Invention Registration No. H2016H published on April 2, 2002 (hereinafter *Wicks*); in view of Ogot *et al.*, US Patent No. 5,648,787 issued on January 15, 1997 (hereinafter *Ogot*); and further in view of J. D. Kraus, “Antennas,” 2<sup>nd</sup> Ed., McGraw Hill, NY (1988), pp. 759-760 (hereinafter *Kraus*)..

**Claims Allowable:** Claims 3, 4, 13, 14, and 22 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in dependent form including all of the limitations of the base claim and any intervening claims.

**Claims on Appeal:** Claims 1, 5-11, 15-21 and 23-25 are on appeal.

#### IV. Status of Amendments

No amendments were filed subsequent to the final Office action dated November 7, 2006.

#### V. Summary of Claimed Subject Matter

Applicant’s antenna structure [100, FIG. 2(a); 200, FIGs. 4(a) and 4(b)] operates over a wide frequency spectrum and offers wider directivity than prior art *endfire*-type devices (10, FIG. 1), which makes the invention better suited to polling applications (page 7, lines 1-5; page 9, lines 24 *et seq.*). Applicant recognized that the narrow directivity of tapered slot antennas is attributable to the phase velocity supported by the antenna’s dielectric substrate (page 2, lines 18-20). In particular, *Applicant’s antenna structure supports a phase velocity greater than the speed of light* (page 2, lines 21-22; page 7, lines 9-10; FIG. 2)

More specifically, Applicant’s antenna structure comprises at least one tapered antenna element [110, FIGs. 2(a) and 2(b); FIG. 3; 210 and 215, FIGs. 4(a) and 4(b)] coupled with a symmetrically shaped finite ground plane [page 2, lines 23-24; 125, FIGs. 2(a) and 2(b); 225, FIG. 4(a)], which supports the relatively wider directivity of the broadband structure (page 7, lines 22-23; page 10, lines 6-7). In addition, the at least one

antenna element comprises a *traveling wave antenna supporting a phase velocity greater than the speed of light*, as set forth in independent Claim 1, lines 8-9, independent Claim 11, lines 11-12, and independent Claim 21, lines 20-21. This type of antenna element is referred to as a *fast wave* element (Page 10, lines 23-24).

In one important embodiment (FIG. 4), a fast wave tapered antenna element (210, 215) is combined with a slow wave antenna element (220) to widen the directivity of the antenna structure and thereby insure greater coverage for polling and/or scanning a three-dimensional space (Page 11, lines 12-21), as set forth in dependent Claim 20.

## VI. Grounds of Rejection to be Reviewed

**Issue A:** The impact of the Board's decision in Appeal No. 2005-2760.

**Issue B:** Whether Claims 1, 5-11, 15-21 and 23-25 are patentable over Wicks in view of Ogot and Kraus under 35 USC §103(a).

## VII. Argument

**Issue A:** In its decision of October 27, 2005 in Appeal No. 2005-2760 the Board held as follows:

- (1) **Claims 1, 3, 5-9, 11, 13 and 15-18:** It *reversed* the Section 102(e) rejection of original Claims 1, 3, 5-9, 11, 13 and 15-18.
- (2) **Claims 2 and 12:** It *reversed* the Section 112 rejection of appealed, original dependent Claims 2 and 12, which required that the at least one tapered antenna element comprise a traveling wave antenna supporting a phase velocity greater than the speed of light. Subsequent to the Board's decision, in Applicant's response of November 28, 2005, this feature was added to independent Claims 1, 11 and 21. Accordingly, original Claims 2 and 12 were canceled. At the time Claims 2 and 12 had not been rejected based on prior art under either Section 102 or Section 103.
- (3) **Claims 10, 19, 21 and 23-25:** It *sustained* the Section 103 rejection of appealed original Claims 10, 19, 21 and 23-25.

(4) **Claims 1, 3, 5-9, 11, 13 and 15-18:** It *stated* that Ogot provides for the deficiencies of Wicks regarding the Section 102(e) rejection of appealed original Claims 1, 3, 5-9, 11, 13 and 15-18, but noted that no Section 103 rejection was before them regarding these claims.

(5) **Claims 1 and 11:** It *made a new Section 103 rejection* of appealed, independent original Claims 1 and 11.

(6) **Claims 3, 5-9, 13 and 15-18:** It *made* “no representations or new grounds of rejection regarding [appealed] original Claims 3, 5-9, 13 and 15-18. We leave those claims for the examiner to revisit if the examiner deems it advisable...”

(7) **Claim 20:** It *made no comment* on original dependent Claim 20, which was at the time allowable and hence not on appeal.

In terms of prior art, the Board considered only Wicks under Section 102 and the Wicks/Ogot combination under Section 103. As discussed hereinafter, the Examiner has since combined Wicks/Ogot with a third reference by Kraus to formulate a new Section 103 rejection of Claims 1, 5-11, 15-21 and 23-25.

Kraus was actually before the Board, but only because Applicant cited it, among other references, to traverse the Examiner’s Section 112 rejection of original Claims 2 and 12; that is, to establish that a phase velocity greater than the speed of light did not violate any fundamental laws of physics. The Board agreed.

As indicated above, the limitations of original Claims 2 and 12 have been incorporated into amended independent Claims 1, 11 and 21.

Thus, *for the first time* the Board is being asked to review the Examiner’s Section 103 rejection of Claims 1, 5-11, 15-19, 21 and 23-25 based on a *new* combination of references: Wicks, Ogot and Kraus instead of the previous combination of only Wicks and Ogot, notwithstanding that all three references have been before the Examiner since Applicant cited Kraus of July 11, 2002.

In addition, *for the first time* the Board is being asked to review the Examiner’s Section 103 rejection of dependent Claim 20 based on the Wicks/Ogot/Kraus combination.

**Issue B:** In Section 2 of the final Office action dated November 7, 2006, Claims 1, 5-11, 15-21 and 23-25 were rejected under 35 USC 103(a) as being obvious over Wicks in view of Ogot and further in view of Kraus.

Section 2, pages 2-4, repeat the Examiner's position regarding the combination of Wicks and Ogot. In the last paragraph on page 4, the Examiner makes the following acknowledgement:

Wicks et al. and Ogot et al. teach every feature of the claimed invention except for the at least one antenna element comprises a traveling wave antenna supporting a phase velocity greater than the speed of light; and a slow wave antenna to widen the directivity of the antenna structure.

However, the Examiner further argues that Kraus supplies the deficiencies of the Wicks/Ogot combination, as follows:

Kraus teaches in figures 16-41 & 16-42 the at least one antenna element (Leaky-wave antennas) comprises a traveling wave antenna (Surface-wave antenna) *to widen the directivity of the antenna structure.* (emphasis added)

In view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using leaky-wave antenna or surface-wave antenna as taught by Kraus *in order to have the structure carries a fast wave ( $v>c$ ) or a slow wave ( $v<c$ )* (See pp759-760). (emphasis added)

This rejection is respectfully traversed for the reasons set forth below:

(1) **Summary of the Invention:** It will be helpful to recall that Applicant's antenna structure , as defined by independent Claims 1, 11 and 21, requires that the "at least one antenna element comprises a traveling wave antenna supporting a phase velocity greater than the speed of light;" that is, a fast wave antenna ( $v > c$ ). In addition, in one embodiment, as set forth in dependent Claim 20, which depends from Claim 11, Applicant's invention also requires

“a slow wave antenna to widen the directivity of the antenna structure” in combination with the fast wave antenna. In a slow wave antenna  $v < c$ .

(2) **Improper Combination:** It is black letter law that a proper Section 103 rejection “requires some reason, suggestion, or motivation from the prior art as a whole for the person of ordinary skill to have combined or modified the references” in the manner suggested by the Examiner. [See, I. H. Donner, *Patent Prosecution*, 3<sup>rd</sup> Ed., BNA Washington, DC (2003), p. 778.] Applicant submits that the above-quoted portion of the Examiner’s rejection, which is the only portion that discusses Kraus, fails to explain *why one skilled in the art would be motivated to modify* the Wicks/Ogot combination in accordance with the fast wave ( $v > c$ ) traveling wave design of Kraus. Without a clear indication of such motivation, the Examiner’s statement is merely an unsupported conclusion. It is, moreover, clearly an impermissible use of hindsight and Applicant’s own teaching. For this reason alone, it is respectfully submitted that Claims 1, 11 and 21 are not obvious in view of Wicks, Ogot and Kraus. There are, however, additional reasons supporting Applicant’s position of non-obviousness; to wit:

(3) **Kraus-Selection of Fast vs. Slow Wave Elements:** As the Examiner correctly points out, Kraus describes separately antenna structures that include either slow wave elements (e.g., Figure 16-41) or fast wave elements (Figure 16-42). However, Kraus fails to teach one skilled in the art why s/he should choose to include a fast wave element over a slow wave element in the Wicks/Ogot combination. An antenna structure including such a fast wave element is the essence of independent Claims 1, 11 and 21. Similarly, Kraus fails to teach one skilled in the art why s/he should choose to include *both* a fast wave element *and* a slow wave element in the Wicks/Ogot combination. An antenna structure including both fast and slow wave elements is the essence of dependent Claims 20.

(4) **Wicks-Slow Wave TEM Propagation:** As Applicant, Dr. G. E. Peterson, has pointed out several times during the prosecution of this case, Wicks teaches

away from the use of a fast wave antenna; to wit, at column 2, lines 66-67, Wicks specifically teaches that the *slot transmission line has a TEM mode of propagation*. As noted in Applicant's July 11, 2002 traversal of the Section 112 rejection in the first Office action, a TEM wave (or mode) is a *slow wave*, which means that its phase velocity is *less than* the speed of light, *not greater than* the speed of light as required by Claims 1, 11 and 21. Therefore, one skilled in the art would be deterred from applying the Kraus fast wave antenna ( $v > c$ ) to the Wicks antenna design and thus to the Wicks/Ogot combination.

(5) **Kraus-Directivity:** The Examiner asserts that Kraus suggests the use of a "traveling wave antenna (Surface-wave antenna) *to widen the directivity of the antenna structure*," but in fact Kraus is silent on the issue of widening directivity. In addition, Applicant's dependent Claim 20 is directed to an embodiment that widens directivity by adding a slow wave element [FIG. 4(a); element 220] to the antenna structure that already includes a fast wave element [FIG. 4(a); elements 210, 215]. As noted above, Kraus fails to suggest the use of a fast wave antenna element in the Wicks/Ogot combination. Kraus likewise fails to suggest that a slow wave antenna widens directivity. Accordingly, the Wicks/Ogot/Kraus combination likewise fails to suggest the use of *both* a fast wave element and a slow wave element in the same antenna structure.

## VIII. Claims Appendix

The Claims under appeal are in Appendix A.

## IX. Evidence Appendix

None

## X. Related Proceedings Appendix

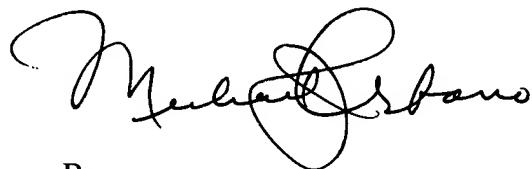
A copy of Appeal No. 2005-2760 is in Appendix B.

## XI. Conclusion

In summary, it is respectfully submitted that Claims 1, 5-11, 15-21 and 23-25 are not rendered obvious by the proposed combination of Wicks, Ogot and Kraus.

Accordingly, reversal of the final rejection is in order.

Respectfully,  
George Earl Peterson



By \_\_\_\_\_

Michael J. Urbano  
Attorney for Applicant  
Reg. No. 24,522  
610-691-7710

Date: 06/27/07

Att.  
Appendices A and B

**APPENDIX A****Claims on Appeal**

1    **1.**    An antenna structure comprising:

2

3                at least one antenna element, the at least one antenna element having at least one  
4                taper; and

5

6                a symmetrical finite ground plane coupled with the at least one antenna element;

7

8                wherein the at least one antenna element comprises a traveling wave antenna  
9                supporting a phase velocity greater than the speed of light.

1    **5.**    The antenna structure of Claim 1, wherein the at least one antenna element is  
2    positioned at an angle from the symmetrical ground plane.

1    **6.**    The antenna structure of Claim 5, wherein the angle is about 90 degrees with  
2    respect to the x-, y- and z- axes.

1    **7.**    The antenna structure of Claim 1, wherein the at least one antenna element is  
2    coupled with the symmetrical ground plane by means of an unbalanced impedance.

1    **8.**    The antenna structure of Claim 7, wherein the unbalanced impedance comprises a  
2    coaxial cable.

1   **9.**   The antenna structure of Claim 7, wherein a first conductor of the unbalanced  
2   impedance mechanically couples the at least one antenna element with the symmetrical  
3   ground plane.

1   **10.**   The antenna structure of Claim 1, wherein the symmetrical ground plane is disk  
2   shaped.

1   **11.**   An antenna structure comprising:

2  
3       an array of at least two antenna elements, each antenna element having at least  
4       one taper;

5  
6       a symmetrical finite ground plane; and

7  
8       an unbalanced impedance for coupling the array of at least two antenna elements  
9       with the symmetrical ground plane;

10  
11       wherein at least one antenna element of the array comprises a traveling wave  
12       antenna supporting a phase velocity greater than the speed of light.

1   **15.**   The antenna structure of Claim 11, wherein each antenna element of the array is  
2   positioned at an angle from the symmetrical ground plane.

1   **16.**   The antenna structure of Claim 15, wherein the angle for each antenna element is  
2   about 90 degrees with respect to the x-, y- and z- axes.

1   **17.**   The antenna structure of Claim 11, wherein the unbalanced impedance comprises  
2   a coaxial cable.

1   **18.**   The antenna structure of Claim 17, wherein a first conductor of the unbalanced  
2   impedance mechanically couples each antenna element of the array with the symmetrical  
3   ground plane.

1   **19.**   The antenna structure of Claim 11, wherein the symmetrical ground plane is disk  
2   shaped.

1   **20.**   The antenna structure of Claim 11, further comprising a slow wave antenna to  
2   widen the directivity of the antenna structure.

1   **21.**   An apparatus comprising:

2                 a transceiver; and

5                 an antenna structure for radiating or capturing electromagnetic energy from or to  
6                 the transceiver comprising:

8                 at least one antenna element having at least one taper, the taper comprising  
9                 a linear profile, a linear constant profile, a broken-linear profile, an  
10                 exponential profile, an exponential constant profile, a tangential profile, a  
11                 step-constant profile, or a parabolic profile;

12

13           a symmetrical disk shaped finite ground plane, the at least one antenna  
14           element being positioned at an angle from the symmetrical disk shaped  
15           finite ground plane; and

16  
17           an unbalanced impedance for coupling the at least one antenna element  
18           with the symmetrical disk shaped finite ground plane;

19  
20           wherein the at least one antenna element comprises a traveling wave  
21           antenna supporting a phase velocity greater than the speed of light.

1     **23.**   The antenna structure of Claim 21, wherein the angle is about 90 degrees with  
2       respect to the x-, y- and z- axes.

1     **24.**   The antenna structure of Claim 21, wherein the unbalanced impedance comprises  
2       a coaxial cable.

1     **25.**   The antenna structure of Claim 21, wherein a first conductor of the unbalanced  
2       impedance mechanically couples the at least one antenna element with the symmetrical  
3       ground plane.

*Peterson 18*  
Serial No. 09/915,963



## APPENDIX B

**Appeal No. 2005-2760**

**Application 09/915,963**

**October 27, 2005**

10/31/05  
mfp

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

## UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte GEORGE EARL PETERSON

Appeal No. 2005-2760  
Application 09/915,963

ON BRIEF

MAILED

OCT 27 2005

PAT. & T.M. OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

Before THOMAS, KRASS, and MACDONALD, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

## DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-3, 5-13, 15-19, 21, and 23-25.

The invention pertains to antenna structures. In particular, the inventive antenna structure comprises a tapered

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antenna element coupled with a symmetrically shaped finite ground plane which supports the relatively wider directivity of the broadband structure. In another embodiment, the antenna structure is said to support a phase velocity greater than the speed of light.

Representative claims 1 and 2 are reproduced as follows:

1. An antenna structure comprising:

at least one antenna element, the at least one antenna element having at least one taper; and

a symmetrical finite ground plane coupled with the at least one antenna element.

2. The antenna structure of claim 1, wherein the at least one antenna element comprises a traveling wave antenna supporting a phase velocity greater than the speed of light.

The examiner relies on the following references:

Ogot	5,648,787	Jul. 15, 1997
Wicks	US H2016 H	Apr. 2, 2002
		(Filed Mar. 5, 1986)

Claims 2 and 12 stand rejected under 35 U.S.C. § 112, first paragraph, as relying on a nonenabling disclosure.

Claims 1, 3, 5-9, 11, 13, and 15-18 stand rejected under 35 U.S.C. § 102 (e) as anticipated by Wicks.

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Claims 10, 19, 21, and 23-25 stand rejected under 35 U.S.C.  
§ 103 as unpatentable over Wicks in view of Ogot.

Reference is made to the briefs and answer for the  
respective positions of appellant and the examiner.

OPINION

Turning, first, to the rejection of claims 2 and 12 under  
35 U.S.C. § 112, first paragraph, the examiner contends that the  
phrase, "the phase velocity being greater than the speed of  
light" "defies conventional theory of physics" (answer-page 3).

If the examiner had a reasonable basis for questioning the  
sufficiency of the disclosure, it was incumbent on appellant to  
come forward with evidence, if they could, to rebut the  
examiner's position. In re Buchner, 929 F.2d 660, 661, 18 USPQ2d  
1331, 1332 (Fed. Cir. 1991).

As a matter of Patent and Trademark Office practice, a  
specification disclosure which contains a teaching of the manner  
and process of making and using the invention in terms which  
correspond in scope to those used in describing and defining the

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subject matter sought to be patented must be taken as in compliance with the enabling requirement of the first paragraph of 35 U.S.C. § 112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt does exist, a rejection for failure to teach how to make and/or use will be proper on that basis; such a rejection can be overcome by suitable proofs indicating that the teaching contained in the specification is truly enabling, In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971); In re Sichert, 566 F.2d 1154, 1161, 196 USPQ 209, 215 (CCPA 1977).

When a rejection is made on the basis that the disclosure lacks enablement, it is incumbent upon the examiner to explain why he/she doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions with acceptable evidence or reasoning which is inconsistent with the contested statement.

Apparently, the examiner is taking the position that nothing can travel faster than the speed of light, as far as conventional physics is concerned, and that, therefore, any recitation of a

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phase velocity being "greater than the speed of light" cannot be describing an enabling invention.

The trouble with the examiner's reasoning is that the examiner has not specifically identified exactly what "conventional theory of physics" is being referenced. As appellants argue, at page 5 of the principal brief, while there may be some notion that the speed of light is the upper bound on the speed at which things travel through space, this does not apply to basic physics principles as they relate to the phase velocity of an electromagnetic wave.

In particular, appellants cite a website, [www.mathpages.com](http://www.mathpages.com), specifically identifying the "Phase, Group, and Signal Velocity" portion thereof, indented under "Physics." Copies of pages 1-6 of that section were attached to appellants' response of September 10, 2003, and we attach same to this decision. At page 2 thereof, after defining "phase velocity" of a wave, the reference goes on to say that "there is no upper limit on the possible phase velocity of a wave," with an explanation as to how a general wave need not embody the causal flow of any physical effects. While a mere citation of a website is usually not probative because there is no assurance, as in, for example, a

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published work, that the subject matter therein has been reviewed by legitimate authorities on the subject, the cited website, with its seemingly reasonable explanations, appears to offer some evidence tending to show the correctness of appellants' position. Moreover, the examiner's response, see infra, to appellants' argument appears to agree that a "fast wave" is a traveling wave having a velocity greater than the speed of light. Thus, the cited claim recitation does not defy the "conventional theory of physics," by the examiner's own admission.

It appears to us that appellants have provided a reasonable explanation and evidence to doubt the examiner's general statement of a phase velocity "greater than the speed of light" somehow defying a conventional theory of physics. The examiner has not advanced any evidence or an acceptable line of reasoning inconsistent with enablement, in view of the evidence submitted by appellant and, therefore, has not sustained his burden.

The examiner responds to appellant's evidence, at pages 6-7 of the answer, by arguing whether waves are "fast" or "slow" and whether the plane wave is in "free space" or not. The examiner then concludes by stating that claims 2 and 12 "need to meet two criteria one is the traveling wave is the fast wave, and the

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other is in free space. None of applicant's invention meets these two criteria."

The examiner's explanation is not persuasive of nonenablement. The examiner now appears to be requiring appellant to add limitations into claims 2 and 12. Not only is the addition of limitations appellant's call, but, as appellant explains, at page 2 of the reply brief, the examiner's "requirement" is unnecessary since, by definition, a traveling wave having a velocity greater than the speed of light is already a fast wave in free space.

Since the examiner has not reasonably shown that having a phase velocity "greater than the speed of light," as claimed, would cause the skilled artisan to not be able to make and use the claimed invention, we will not sustain the rejection of claims 2 and 12 under 35 U.S.C. § 112, first paragraph.

Turning, now, to the rejection of claims 1, 3, 5-9, 11, 13, and 15-18 under 35 U.S.C. § 102(e), we also will not sustain this rejection.

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It is the examiner's position that Wicks discloses, in Figures 1-5, the antenna structure claimed.

Appellant argues that Wicks lacks a teaching of the claimed "symmetrical finite ground plane." In particular, appellant points out that Wicks depicts a one-dimensional ground plane as a horizontal line and that this is a "typical depiction of an infinite ground plane" (principal brief-page 8). Appellant also points out that Figure 4 of Wicks shows a ground plane depicted in three-dimensions as an irregular plate, with the cut-away view "again suggesting an infinite ground plane" (principal brief-page 8). Appellant argues that Wicks gives no indication whatsoever that the ground planes depicted therein are "symmetrical" in any way.

The examiner's only response to appellant's allegations is that in Figure 5 of Wicks, the ground plane is shown as a finite ground plane, "the other figures depicting this ground plane are showing it in abbreviated form for convenience only. Second, the ground plane extends to infinity, this makes the ground plane symmetrical since extending to infinity is a form of translational symmetry" (answer-page 8).

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While appellant presents no specific definition of "symmetrical finite ground plane," the examiner does not explain why the ground plane in Wicks is considered to be such a ground plane. The burden of proof is on the examiner in the first instance. In the instant case, the examiner has clearly not carried that burden in establishing anticipation of the instant claimed subject matter. It is not enough to say that a ground plane that extends to infinity must be a symmetrical finite ground plane, as claimed, without the examiner offering any definition of his/her own for the claimed term.

Since Wicks is entirely silent as to the matter of a symmetrical finite ground plane, we would need to resort to speculation to make any determination that Wicks, in fact, discloses such a ground plane. Deficiencies in the factual basis for an examiner's rejection cannot be supplied by resorting to speculation or unsupported generalities. In re Freed, 425 F.2d 785, 787, 165 USPQ 570, 571 (CCPA 1970); In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

Accordingly, we will not sustain the rejection of claims 1, 3, 5-9, 11, 13, and 15-18 under 35 U.S.C. § 102(e).

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However, we will sustain the rejection of claims 10, 19, 21, and 23-25 under 35 U.S.C. § 103.

Ogot is applied by the examiner for a teaching of a symmetrical disk shaped finite ground plane (elements 210, 250 in Figure 3A), alleged to be missing from Wicks. The examiner concluded that it would have been obvious to substitute the symmetrical disk shaped finite ground plane of Ogot for the metal ground plane of Wicks "in order to maximize the surface area of the ground plane perpendicular to the transmission element, and provides (sic) a uniform transmission pattern" (answer-page 6), referring to column 4, lines 66-67, and column 5, lines 1-3, of Ogot.

We note that appellant does not dispute the teachings of Ogot, but merely argues that the rejection is improper because the references "teach away" from each other since the artisan "would not be motivated to substitute the Ogot narrow band circular disk ground plane for the Wicks broadband ground plane" (principal brief-pages 11-12).

At the outset, we note that appellant has not denied that Ogot discloses a "symmetrical finite ground plane" that is "disk

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shaped." Thus, the only issue here is whether the artisan would have combined the teachings of the two applied references.

The examiner has provided a rational basis for such a combination in citing Ogot's teaching that the employment of such a disk shaped finite ground plane has the advantage of maximizing the surface area of the ground plane perpendicular to the transmission element, and providing a uniform transmission pattern (column 5, lines 1-3, of Ogot), leading the artisan to use such a ground plane in Wicks.

We do not find persuasive appellant's argument that the references "teach away" from each other. It is appellant's position that Wicks describes a broadband antenna "which works best with a relatively large ground plane" and that Wicks' ground plane is much larger than the antenna elements. Appellant contrasts this with Ogot's teaching of a radar antenna in which the diameter of a circular ground plane is between  $\lambda/8$  and  $\lambda/4$ , referring to column 3, lines 20-23, column 4, lines 61-64, and column 5, lines 11-21. Therefore, appellant concludes, at page 11 of the principal brief, once the diameter of Ogot's ground plane is set to satisfy one wavelength, it cannot simultaneously

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satisfy the same requirement for a wide range of wavelengths demanded by the Wicks antenna.

Appellant's argument appears to presuppose that the artisan would make a direct substitution, or a bodily incorporation, of Ogot's ground plane for Wicks' ground plane. Clearly, the test of obviousness is not whether features of a secondary reference may be bodily incorporated into the primary reference's structure, nor whether the claimed invention is expressly suggested in any one or all of references; rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. It is not necessary that a device shown in one reference can be physically inserted into the device shown in another reference to justify combining their teachings in support of a rejection. In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

Wicks lacks a teaching of a symmetrical disk shaped finite ground plane, though the reference teaches an antenna structure having a ground plane. Ogot is alleged by the examiner to teach the symmetrical disk shaped finite ground plane, an allegation which has not been denied by appellant, and Ogot also provides a teaching of advantages attained by using such a symmetrical disk

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shaped finite ground plane (column 5, lines 1-3). Accordingly, it would appear reasonable that the skilled artisan would have been led to employ such a disk shaped ground plane in other antenna structures, seeking the advantages taught by Ogot. Now, in applying such a teaching, the artisan would not, willy nilly, merely make a direct substitution but, rather, the artisan would have employed prudent engineering considerations. That is, contrary to appellant's implications in the "teaching away" argument, supra, it is clear that the artisan would have adjusted for the bandwidth size of the necessary ground plane. Merely because the "size" of the ground planes may be different in Wicks and Ogot, this does not, per se, indicate a "teaching away" since the artisan would have been expected to make adjustments in size, and other prudent engineering considerations, in adapting different antenna characteristics to differing environments.

Ogot's teaching of being able to maximize the surface area of the ground plane perpendicular to the transmission element, and to provide a uniform transmission pattern, by the use of a symmetrically disk shaped finite ground plane, in our view, would have clearly suggested to the artisan to use a ground plane having those characteristics in other antenna structures, such as in Wicks, in order to achieve similar advantages. We find no

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deterrence to employing Ogot's teaching to Wicks because of Wicks' broadband antenna "which works best with a relatively large ground plane," as argued by appellant at page 11 of the principal brief.

Accordingly, we will sustain the rejection of claims 10, 19, 21, and 23-25 under 35 U.S.C. § 103.

We also note that, in our view, Ogot provides for the deficiencies of Wicks noted supra with regard to our reversal of the rejection of claims 1, 3, 5-9, 11, 13, and 15-18 under 35 U.S.C. § 102 (e). However, there is no rejection of these claims under 35 U.S.C. § 103 before us.

Accordingly, we make the following new ground of rejection under 37 CFR § 41.50(b) :

Claims 1 and 11 are rejected under 35 U.S.C. § 103 as unpatentable over Wicks in view of Ogot for the reasons supra, anent the rejection of claims 10 and 19 under 35 U.S.C. § 103. Ogot clearly provides for the deficiencies of Wicks with regard

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to the "symmetrical finite ground plane" deemed to be missing from Wicks in the rejection of claims 1 and 11 under 35 U.S.C. § 102(e).

We make the new ground of rejection against claims 1 and 11 because the limitations of these claims are clearly included in dependent claims 10 and 19, the rejection under 35 U.S.C. § 103 of which we sustained. Thus, claims 1 and 11 should be included in the rejection under 35 U.S.C. § 103 based on the Wicks/Ogot combination.

We make no representations or new grounds of rejection regarding claims 3, 5-9, 13 and 15-18. We leave those claims for the examiner to revisit if the examiner deems it advisable to make any findings regarding those claims and the application of the Wicks/Ogot combination thereto.

Since we have not sustained the rejection of claims 2 and 12 under 35 U.S.C. § 112, first paragraph, and the rejection of claims 1, 3, 5-9, 11, 13, and 15-18 under 35 U.S.C. § 102 (e), but we have sustained the rejection of claims 10, 19, 21, and 23-25 under 35 U.S.C. § 103, the examiner's decision is

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affirmed-in-part. We also enter a new ground of rejection against claims 1 and 11, in accordance with 37 CFR § 41.50(b).

This decision contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 CFR § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED-IN-PART  
37 CFR § 41.50(b)

JAMES D. THOMAS  
Administrative Patent Judge

ERROL A. KRASS  
Administrative Patent Judge

ALLEN R. MACDONALD  
Administrative Patent Judge

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